PART 2: ALTERNATIVES ANALYSIS

2.1 Description of Corridor Alternatives

Following is a description of the widening and new location alternatives that were considered as part of this Pre-TIP Study. Refer to Figure 6: Corridor Alternatives, for depiction of each of the widening and new location alternatives. Each of these alternatives is represented by a 1000-foot corridor for the purposes of this study, although the actual right-of-way was assumed to be approximately 150-feet for widening and 300-feet for new location alternatives.

For widening and new location alternatives, each of the corridors extends from US 421 west of the Town of Boone in the vicinity of NC 105 Bypass (SR 1107) and ends at US 421 east of Boone. Each corridor provides interchanges at US 421/321 west and US 421/221 east of Boone, except for Corridor 8. Further, all of the corridors except Corridors 7 and 8 provide additional interchanges at NC 105 and US 321/221 south. All of the Corridor Alternatives except Corridors 7 and 8 must be combined with either Corridor 1N, 2N, or 5N to complete the connection to US 421 west of Boone.

- **Corridor 1** starts with an interchange at NC 105 in the vicinity of NC 105 Bypass (SR 1107). It follows a path on new location, just south of NC 105 and then provides an interchange at US 321/221 south in the vicinity of Shadowline Drive. This corridor terminates with an interchange at US 421/221 east in the vicinity of Bamboo Road (SR 1514). This corridor is similar to the one adopted on the 1979 and 1991 Boone Thoroughfare Plans (refer to Appendix A).

- **Corridor 1A** is the same as Corridor 1, except that after the interchange at NC 105 in the vicinity of NC 105 Bypass (SR 1107), it follows existing NC 105. This corridor provides for the upgrade of the existing NC 105 roadway such that the improved US 421 would follow this existing route. This corridor then leaves NC 105 and proceeds eastward on new location on the same path as Corridor 1, including the interchanges at US 321/221 south and US 421/221 east of Boone.

- **Corridor 1B** is the same as Corridor 1, except that east of US 321/ 221 it follows a path further north and west of Corridor 1, avoiding the new crossings of the South Fork New River. All interchanges are in the same locations as Corridor 1.

- **Corridor 2** starts with an interchange at NC 105 in the vicinity of NC 105 Bypass (SR 1107). It follows a path on new location, following a ridge further south of NC 105 than Corridor 1. It provides an interchange at US 321/221 south in the vicinity of Deerfield Rd (SR 1522). This corridor terminates with an interchange at US 421/221 east in the vicinity of Bamboo Road (SR 1514).

- **Corridor 2A** initially follows Corridor 1A from the interchange at NC 105 in the vicinity of NC 105 Bypass (SR 1107), providing for the upgrade of the existing NC 105 roadway. This corridor then leaves NC 105 and proceeds eastward on new location, going further south to follow Corridor 2, including the interchanges at US 321/221 south and US 421/221 east of Boone.

- **Corridor 2B** initially follows Corridor 2 from the interchange at NC 105 in the vicinity of NC 105 Bypass (SR 1107), following the ridge south of NC 105. This corridor then goes on a new path further north to follow Corridor 1B, including the interchanges at US 321/221 south and US 421/221 east of Boone.

- **Corridor 3** initially follows Corridor 2 from the interchange at NC 105 in the vicinity of NC 105 Bypass (SR 1107), following the ridge south of NC 105 and providing an interchange at US 321/221 south in the vicinity of Deerfield Rd (SR 1522). Then Corridor 3 deviates from Corridor 2, extending further south as it continues east of US 321/221 and terminating with an interchange at US 421/221 in the vicinity of Brown's Chapel Road (SR 1513).

- **Corridor 5** starts with an interchange at NC 105 west of the intersection with NC 105 Bypass (SR 1107). It follows a path on new location further south than any other corridors and then provides an interchange at US 321/221 south. East of US 321/221, this corridor merges with Corridor 3, following it to terminate with an interchange at US 421/221 in the vicinity of Brown's Chapel Road (SR 1513).

- **Corridor 6** starts with an interchange at NC 105 in the vicinity of NC 105 Bypass (SR 1107). It follows a path on new location, just south of NC 105 and then provides an interchange at US 321/221 south in the vicinity of Shadowline Drive. This corridor terminates with an interchange at US 421/221 east along the relocation of US 421 between Bamboo Road (SR 1514) and Brown's Chapel Road (SR 1513).

- **Corridor 7** starts with an interchange at US 421/321 west in the vicinity of NC 105 Bypass (SR 1107). It follows a path on new location, north of existing US 421 (King Street). It provides an interchange at NC 194 north of existing US 421 (King Street). This corridor terminates with an interchange at US 421/221 east in the vicinity of Bamboo Road (SR 1514).

- **Corridor 8** is widening the existing US 421 (King Street) from NC 105 Bypass (SR 1107) to the vicinity of Bamboo Road (SR 1514). This corridor provides for the upgrade of the existing roadway such that US 421 would continue to follow this existing route.

Each of the Corridors 1-6 must be combined with 1N, 2N, or 5N.

- **Corridor 1N** provides an interchange at US 421/321 east and NC 105 Bypass (SR 1107). It then follows existing NC 105 Bypass (SR 1107) from its intersection with US 421/ 321 to its intersection with NC 105. This corridor provides for the upgrade of the existing NC 105 Bypass (SR 1107) roadway such that the improved US 421 would follow this existing route.

- **Corridor 2N** provides an interchange at US 421/321 east of the intersection with NC 105 Bypass (SR 1107). It extends from US 421/321 on new location east of NC 105 Bypass (SR 1107) and then utilizes part of the existing NC 105 Bypass (SR 1107) near the intersection with NC 105.

- **Corridor 5N** provides an interchange at US 421/321 west of the intersection with NC 105 Bypass (SR 1107). It extends from US 421/321 on new location west of NC 105 Bypass (SR 1107) and terminates at NC 105 west of the intersection with NC 105 Bypass (SR 1107).

Each of the proposed alternatives is planned as a four-lane, median-divided roadway. The relocated US 421 is proposed to have full control of access, meaning no at-grade intersections or driveway openings would be allowed directly to the new roadway. For the widening alternative, Corridor 8, full control of access was not assumed because it would not be achievable.

2.2 Analysis of Corridor Alternatives

2.2.1 Summary of Information Developed and Meetings/ Outreach

NCDOT initiated this study in 2002 based on a request by the Town of Boone to begin a more detailed study of options for improvements to US 421, including consideration of recommendations from a local task force that had formed in 1999. The Merger Project Team met on September 18, 2002 for a Scoping/ Kick Off Meeting to determine the study process and study area boundary (refer to Figure 3: Study Area Boundary and Appendix B). The Team met again on January 22, 2003, reaching concurrence on Concurrence Point 1: Purpose and Need (refer to Appendix C: Concurrence on Purpose and Need). NCDOT held a scoping meeting on December 2, 2003, to further review the project and gather additional information. Refer to Appendix B: Merger Team Meeting Summaries for additional information on the merger team meetings and scoping meeting.

As part of the alternatives analysis for this study, information was developed on the traffic benefits and the environmental and development impacts of various options (refer to Section 2.2.2). Additionally, a precursory community impacts assessment, titled '*Pre-TIP Community Study*' (as finalized January 2005), was prepared for

NCDOT-Office of Human Environment by URS Corporation (refer to Appendix E: Local/ Public Involvement).

Information on the purpose and need for the project and preliminary corridor alternatives were shared at a Citizen's Informational Workshop on March 11, 2004. Comments were received through provided comment forms and a 'Post It Board' exercise, where citizens were asked to post their top 4 goals for the proposed project. These comments were analyzed and compiled in order to inform project decisions, as documented in the report prepared for NCDOT- Transportation Planning Branch by URS Corporation entitled 'Summary of Citizens Comments and Concerns', dated September 26, 2004 (refer to Appendix E: Local/ Public Involvement).

The Merger Project Team met again on March 15, 2005 to consider all the information on alternatives. After reviewing additional information distributed on May 23, 2006, the Merger Project Team reached concurrence on Concurrence Point 2: Alternatives to be Carried Forward for Detailed Study by December 2006 (refer to Appendix D: Concurrence on Detailed Study Alternatives). The Alternatives to be Carried Forward were selected based on meeting the purpose and need for the improvement, providing the needed traffic benefits while minimizing environmental and development impacts, and public input.

2.2.2 Benefits and Impacts Assessment

Information on the benefits and impacts of the various corridor alternatives is shown in Table 1: Benefits and Impacts of All Corridor Alternatives (US 421 Improvement/ Daniel Boone Parkway). Note that all of the corridors except Corridor 7 and 8 must be combined with 1N, 2N, or 5N to complete the connection to US 421 west of Boone. Refer to Figure 6b: Corridor Alternatives and Environmental Data for depiction of the corridors with the environmental features in the area. Figure 6c: Corridor Alternatives shows the 1000-foot study area for each corridor on aerial photography.

The source of data for estimating impacts is Geographic Information Systems (GIS) data from the Center for Geographic Information and Analysis (CGIA) and various other agencies. Later in the planning process, field-verification of the data within the study area will occur prior to the final calculation of impacts for decision-making.

In order to quantify impacts, a right-of-way width of 300-feet in the center of the 1000-foot corridor was assumed for alternatives on new location. A right-of-way width of 150-feet was assumed for Corridor 8, which is widening existing US 421 (King Street). All impacts are listed that fall within this assumed right-of-way width in the center of the corridor. Note that as planning and design proceed for this project, the actual roadway location will be further defined and revised within the corridor in an effort to minimize impacts.

The ‘Projected 2020 Traffic Benefits’ for each corridor is shown as an indicator of the relative travel benefit provided by each corridor. The level of benefit is based on an estimate of average daily traffic volumes expected to use the given corridor alternative by the year 2020. These future volume estimates are based on information from the travel demand model developed for the Boone area. A travel demand model is used to approximate what travel patterns exist, as well as to project travel volumes in the future. Travel demand models are based on existing and projected land use, and are calibrated to existing traffic volumes. For the Boone area, the travel demand model was originally developed as part of the 1991 Thoroughfare Plan update. It was revised in 1998 to include current traffic growth data and updated land use projections, provided by the town planning staff.

The ‘Estimated Cost’ for each corridor is a combination of the construction and right-of-way costs for each alternative. The construction and right-of-way cost estimates were developed by NCDOT’s Project Services Unit and Right-of-Way Branches, respectively.

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Table 1: Benefits and Impacts of All Corridor Alternatives (US 421 Improvements/ Daniel Boone Parkway)[1]

	CORRIDORS														
CATEGORY	**7**	**8**	**1**	**1A**	**1B**	**2**	**2A**	**2B**	**3**	**5**	**6**	**6A**	**1N**	**2N**	**5N**
Length (miles)	5.0	4.2	4.4	4.4	4.4	5.8	5.7	4.6	7.7	8.7	7.5	6.4	1.7	1.6	2.6
Number of Interchanges	3	0	Corridors 1 - 6A each are planned to have 3 interchanges										1	1	1
Parcels Taken or Partially Impacted	281	316	240	270	251	245	284	238	325	345	281	227	245	148	97
Structures (Residents or Businesses)	207	176	184	218	182	171	207	174	121	141	134	116	213	136	34
Public Schools[2]	0	0	1a	1a	1a	0	1a	0	0	0	0	0	1b	0	1b
Parks[3]	1a	0	1b	1b	0	0	0	0	0	0	1b	1b	0	0	0
Churches	3	5	1	1	1	1	1	1	1	0	0	1	3	1	2
Cemeteries	No cemeteries are expected to be impacted by any of the corridors.														
National Register Historic Structures	0	2	No national register historic structures are expected to be impacted by any of the corridors, except Corridor 8.												
Natural Heritage Occurrence Sites (Known Federal Listed Species Habitat)[4]	0	0	1a	1a	1a	2a,b	2a,b	1a	0	1c	0	0	0	0	0
FEMA 100 Year Floodplain Impacts (acres)	8.1	1.4	45.9	61.1	27.5	40.2	53.1	22.1	25.3	32.6	45.2	42.1	1.7	3.8	0.8
Hazardous Material Sites[5]	3	5	2	2	2	4	4	2	1	2	2	2	2	0	0
National Wetlands Inventory-Wetland Impacts (acres)	0.1	0	0.4	0.4	0.4	0.5	0	0.7	0.5	0	0.3	0.7	0	0	0
Number of Stream Crossings	4	4	6	10	4	5	9	4	5	6	7	5	1	3	3
Length of Stream Within the Corridor (miles)	0.5	0.2	1.5	2.5	1.3	1.1	1.9	1.0	1.2	1.2	2.0	1.4	0.4	0.6	0.7
Projected 2020 Traffic *BENEFITS*	Low	Low	High	High	High	High	High	High	Med-ium	Med-ium	Med-ium	Med-ium	The benefits of Corridors 1N, 2N, & 5N are similar.		
Estimated Cost (millions)	127	137	114	95	114	136	110	127	147	208	241	152	47	36	52

Footnotes:

[1]All of the Corridors except 7 and 8 must be combined with either 1N, 2N, or 5N to complete the connection to US 421 west of Boone. A right of way width of 300 feet within the 1000-foot corridor was assumed for corridors on new location. A right of way width of 150 feet was assumed for Corridor 8, which is upgrading the existing US 421 (King Street). The source of data for estimating impacts is Geographic Information Systems (GIS) data from the Center for Geographic Information and Analysis (CGIA) and various agencies.

[2]Public Schools: a-Watauga High School (current location off of NC 105), b- Caldwell Community College

[3]Parks: a-Junaluska Park, b-Boone Greenway

[4]Natural Heritage Occurrence Sites: a,b,c represent different species

[5]Hazardous Material Sites includes National Pollutant Discharge Elimination System Sites, Hazardous Waste Facilities, Solid Waster Facilities, and Groundwater Incidents.

Table 1: Benefits and Impacts of All Corridor Alternatives

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2.2.3 Widening and New Location Corridor Alternatives Eliminated from Further Consideration

Following is a description of the widening and new location corridor alternatives that were eliminated from further consideration based on the information generated through this Pre-TIP Study.

- **Corridor 1** crosses the South Fork of the New River in two locations. Corridors 1B/ 2B were developed, in part, to provide an alternative that avoids this impact. Additionally, this corridor has one of the highest levels of community impacts according to the precursory community impacts assessment.

- **Corridor 1A** crosses the South Fork of the New River in two locations. Corridors 1B/ 2B were developed, in part, to provide an alternative that avoids this impact. This corridor had one of the highest levels of impacts according to the precursory community impacts assessment. Additionally, this corridor does not adequately meet the purpose and need of improving traffic flow and safety, as full control of access could not be achieved along existing NC 105. Further, this corridor has the highest level of floodplain impacts and stream impacts, in terms of number of crossings and length of streams within the corridor.

- **Corridor 2A** does not adequately meet the purpose and need of improving traffic flow and safety, as full control of access could not be achieved along existing NC 105. Further, this corridor has one of the highest level of floodplain impacts and stream impacts, in terms of number of crossings and length of streams within the corridor.

- **Corridor 5** does not adequately meet the purpose and need of improving traffic flow and safety, as it has one of the lowest levels of projected traffic use due to being the longest corridor (8.7 miles) and the furthest location south of Boone. Additionally, this corridor has one of the highest impacts to the natural environment due to its length and remote location. This corridor has the highest impacts to High Quality Outstanding Resource Water Zones and Water Supply Watersheds (refer to Figure 6b).

- **Corridor 7**, as the only alternative on new location north of existing US 421 (King Street), does not adequately meet the purpose and need of providing system linkage to US 321/ 221 south and NC 105 west. Related to this issue is its failure to adequately meet the purpose and need of improving traffic flow and safety, as it has the lowest level of projected traffic use. Because it does not provide linkage to US 321/ 221 south and NC 105 west, this corridor only serves that portion of traffic that is through traffic on US 421; it does not serve the other significant portions of traffic seeking to travel from US 421 to US 321 and to NC 105 (see Section 1.7.1 for more information on this needed system linkage). Further, this corridor has one of the highest levels of community impacts according to the precursory community impacts assessment.

- **Corridor 8**, as the alternative to widen existing US 421 (King Street), does not adequately meet the following components of the purpose and need: to reduce the mixed use of King Street by local and through traffic, to provide system linkage to US 321/ 221 south and NC 105 west, and to improve traffic flow and safety. As a widening alternative, this corridor would result in local traffic and through traffic continuing to use existing King Street, which is a congestion and safety concern. Because it does not provide linkage to US 321/ 221 south and NC 105 west, this corridor only serves that portion of traffic that is through traffic on US 421; it does not serve the other significant portions of traffic seeking to travel from US 421 to US 321 and to NC 105 (see Section 1.7.1 for more information on this needed system linkage). This corridor does not adequately provide for traffic flow and safety improvements due to its failure to separate local and through traffic and the inability to achieve full control of access on this corridor. Further, this corridor has one of the highest levels of community impacts according to the precursory community impacts assessment. It is also the only corridor that impacts National Register Historic Structures.

2.2.4 Other Types of Alternatives Eliminated from Further Consideration

Following is a description of other types of alternatives considered and eliminated from further study, in addition to the widening and new location alternatives in Section 2.2.3.

Widening Existing Roads

Some of the widening/ new location corridor alternatives included widening existing NC 105 as a portion of the route for US 421. Additionally, it was considered whether widening other roads in the area could serve as the route for US 421 or would handle enough of the traffic flow and safety needs to allow US 421 to continue to be routed on King Street. There was no combination of widening existing routes that would fully serve as an alternative to US 421, meaning that some new location sections would still be needed to complete the connection.

As described in Section 1.5.1, some traffic currently uses Bamboo Road (SR 1514), Wilson Ridge Road (SR 1522), Deerfield Road (SR 1523), and other local roads due to the congestion on US 421 (King Street). These facilities are designed to serve local traffic and to provide access to adjacent properties.

Widening existing roads, such as these, would force these facilities to provide for through travel in addition to their intended local use. Widening these existing roads would not meet the purpose and need to provide system linkage to NC 105 west, as they only connect to US 321/ 221 south. This option would not adequately meet the purpose and need to improve traffic flow and safety. Even with the additional capacity provided by widening, these facilities are not expected to be able to handle both their current local travel as well as through traffic from US 421. Widening these facilities to a multi-lane cross-section also poses significant design constraints due to their current horizontal and vertical alignments. Further, impacts to existing development (residents and businesses) along these roads

would be extensive. Full control of access would not be possible to achieve due to the density of current development along these roads. Therefore, the option to widen existing roads was determined to not adequately meet the purpose and need for US 421 Improvements.

Other Modes

Providing additional transportation services through other modes of travel was also considered. Providing transit services was determined to not meet the purpose and need for US 421 Improvement because it would not adequately reduce the mixed use of King Street by local and through traffic, provide system linkage to US 321/ 221 south and NC 105 west, or improve traffic flow and safety. Additional transit services would serve some local transportation needs, but would not provide for US 421 through traffic or traffic between US 421 and US 321/ 221 south and NC 105 west. It would not provide enough relief to local travel to allow US 421 to continue to be routed along King Street.

Rerouting trucks was also considered to determine if it would help meet the purpose and need to reduce the mixed use of King Street and the other facilities by local and through traffic. However, trucks are currently routed along King Street only east of the NC 105 intersection, and then are routed along US 321/ 221 and NC 105. Along King Street trucks only account for 2 – 3 % of the traffic and on facilities that serve as truck routes they account for 5 – 6 % of the total traffic. Therefore, trucks do not make up a significant enough portion of the total traffic to impact the overall congestion significantly. Further consideration to rerouting trucks was determined to not meet the purpose and need for US 421 Improvement because it would not adequately reduce the mixed use of King Street by local and through traffic, provide system linkage to US 321/ 221 south and NC 105 west, or improve traffic flow and safety.

2.2.5 Summary of Analysis

Of the widening and new location corridor alternatives considered, Corridors 1, 1A, 2A, 5, 7, and 8 were eliminated from further consideration due to not meeting the purpose and need for US 421 Improvements or unacceptably high impacts to the natural or built environment. Additionally, options to widen existing roads, provide additional transit services, or reroute trucks were determined to not adequately meet the purpose and need for US 421 Improvements.

The Alternatives to be Carried Forward for Detailed Study are described further in Section 2.4. To correlate the numbering of the corridors between all the alternatives studied (as described in Section 2.1 and shown on Figure 6) and those selected to carry forward (as described in Section 2.4 and shown on Figure 7), refer to the following:

- Corridor 1B plus Corridor 2N become new Corridor # 1
- Corridor 2 plus Corridor 1N become new Corridor # 2
- Corridor 6 plus Corridor 5N become new Corridor # 3
- Corridor 3 plus Corridor 1N become new Corridor # 4

2.3 Alternatives to be Carried Forward for Detailed Study

Following is a description of the alternatives that the Merger Team reached concurrence on being the Alternatives to be Carried Forward for Detailed Study (refer to Appendix D: Concurrence on Detailed Study Alternatives). Refer to Figure 7: Corridor Alternatives to Study Further, for depiction of each of the widening and new location alternatives. Each of the corridors extends from US 421 west of the Town of Boone in the vicinity of SR 1107 (NC 105 Bypass), intersects US 321/221 south of NC 105, and ends at US 421 east of Boone. Each corridor provides interchanges at US 421/321 west, NC 105, US 321/221 south, and US 421/221 east of Boone. Note that these corridors are described by the New Corridor numbers, as explained in Section 2.3.

- **Corridor 1** extends from US 421/321 east of SR 1107 (NC 105 Bypass) on new location then utilizes part of the existing SR 1107. It continues on new location, intersecting US 321/221 south of NC 105 and ending at US 421/221 east of Boone in the vicinity of the western intersection with US 421/221 and Old US 421.

- **Corridor 2** uses existing SR 1107 from US 421/321 west of Boone to NC 105. It continues on new location, intersecting US 321/221 in the vicinity of SR 1522 (Deerfield Rd) and ending at US 421/221 east of Boone (similar location to the end of Corridor 1).

- **Corridor 3** extends from US 421/321 west of SR 1107 on new location, intersecting NC 105 west of SR 1107. It continues on new location, intersecting US 321/ 221 in the vicinity of SR 1543 (Jordan V. Cook Rd) and ending at US 421/221 east of the intersection of US 421 and Old US 421.

- **Corridor 4** follows Corridor 2 from US 421/321 west of Boone to the interchange location on US 321/221. Then Corridor 4 deviates from Corridor 2, extending further south as it continues east of US 321/221 and ending at US 421/221 east of Boone in the vicinity of the eastern intersection with US 421/221 and Old US 421.

Corridor combinations can be created from the 4 corridors listed above. Each corridor can be divided into sections, as shown on Figure 7. Section A is from US 421/321 west of Boone to NC 105, Section B is from NC 105 to US 321/221, and Section C is from US 321/ 221 to US 421/221 east of Boone. To further aid in combining various sections of the corridors, several corridor 'connectors' are shown. For example, to combine Corridor 1 to the west with Corridor 2 to the east in Section B, the '1B to 2B Connector' would be used.

Refer to Table 2: Benefits and Impacts of Corridor Alternatives to Carry Forward for Detailed Study (US 421 Improvements/ Daniel Boone Parkway) for a summary of the

benefits and impacts of each of these corridors. Also, Appendix B contains this information broken out by each corridor section, as well as for various combinations using the connectors (see the 'Additional Information Distribution Memo dated May 23, 2006). Refer to Figure 7b: Corridor Alternatives and Environmental Data for depiction of the corridors with the environmental features in the area. Figure 7c: Corridor Alternatives shows the 1000-foot study area for each corridor on aerial photography.

Public input on these and all the alternatives studied were obtained through various outreach efforts, including the Citizen's Informational Workshop on March 11, 2004, as documented in the report prepared for NCDOT-TPB by URS Corporation entitled *'Summary of Citizens Comments and Concerns'*, dated September 26, 2004.

The most common comments were on the nature of the traffic solutions needed in the area, such as desire to ensure consideration of no-sprawl options, use of existing corridors, and offering more transit options. The next most common comments were in support of maintaining the local character of neighborhoods and community cohesion and protecting important local resources such as water quality and scenic vistas. Concerning comments specific to the proposed corridor alternatives, Corridors 3 and 4 received the most comments. Corridors 3 and 4 were both the most favored and the least favored by local citizens. In 2001, a local task force had developed and shown the public the B and C sections of Corridor 3, referring to it as the 'Daniel Boone Parkway.' For more information about public input on all the alternatives studied, refer to Appendix E: Local/ Public Involvement.

Additionally, a precursory community impacts assessment, titled *'Pre-TIP Community Study'* (as finalized January 2005), was prepared for NCDOT-Office of Human Environment by URS Corporation. Analysis of community characteristics was completed at the census block group level. This assessment categorized Corridors 1 and 2 as urban commercial alternatives and Corridors 3 and 4 as rural alternatives. The urban commercial alternatives are expected to result in more displacements, but lower potential to cause changes to existing types of development. For more information about this community impacts assessment, refer to Appendix E: Local/ Public Involvement.

The primary outcomes of this Pre-TIP Study are a formal concurrence on the Purpose and Need for the proposed improvements and formal concurrence on the Alternatives to be Carried Forward for Detailed Study (refer to Appendices C and D). After the project is funded in the TIP, this information is intended to serve as the starting point as the project is taken through the remainder of the NEPA/ Section 404 Merger Process.

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Table 2: Benefits and Impacts of Corridor Alternatives to be Carried Forward for Detailed Study (US 421 Improvements/ Daniel Boone Parkway)

	CORRIDORS[1]			
CATEGORY	**Corridor 1**	**Corridor 2**	**Corridor 3**	**Corridor 4**
Length (miles)	6.0	7.5	10.1	9.4
Number of Interchanges	4	4	4	4
Parcels Taken or Partially Impacted	399	490	378	570
Structures (Residents or Businesses)	318	384	168	334
Public Schools [2]	1a	1b	1b	1b
Parks [3]	0	0	1a	0
Churches	2	4	2	4
Cemetaries	0	0	0	0
National Register Historic Structures	0	0	0	0
Natural Heritage Occurrence Sites (Known Federal Listed Species Habitat) [4]	1a	2a,b	0	0
Hazardous Material Sites [5]	2	6	2	3
National Wetlands Inventory-Wetland Impacts (acres)	0	1	0	1
Water Supply Watersheds Total (acres)	0	104	193	144
Critical Water Supply (acres)	0	50	31	20
High Quality Outstanding Resource Water Zones (acres)	0	39	62	39
FEMA 100 Year Floodplain Impacts (acres)	31	42	46	27
Number of Stream Crossings	7	6	10	6
Length of Stream Within the Corridor (feet)	9800	7900	13900	8600
Projected 2020 Traffic Use [6]	35,800 - 47,400	35,300 - 47,100	30,300 - 39,400	35,600 - 32,200
Estimated Cost (millions)	149.4	182.7	293.7	193.7

NOTES:

Source: Geographic Information Systems (GIS) data from the Center for Geographic Information and Analysis (CGIA) and various agencies.

[1] Impact Totals are based on an assumed right of way width of 300' within the 1000' corridor, with a larger area of approximately 44 acres assumed at interchange locations.

[2] Schools: a-Watuaga High School, b-Caldwell Community College

[3] Parks: Boone Greenway

[4] Natural Heritage Occurrences: a-phenacobius teretulus, b-etheostoma kanawhae

[5] Hazardous Materials Sites includes National Pollutant Discharge Elimination System Sites, Hazardous Waste Facilities, Solid Waste Facilities and Groundwater Incidents.

[6] Projected 2020 Traffic Use is an estimated range of the Average Daily Traffic expected to use the new facility between NC 105 and US 421/221 east of Boone.

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U.S. 421 IMPROVEMENTS/DANIEL BOONE PARKWAY

CORRIDOR ALTERNATIVES

TIP PROJECT U-2703

0 0.25 0.50 0.75

SCALE IN MILES

February 12, 2004

BOONE
WATAUGA COUNTY
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING AND ENVIRONMENT
TRANSPORTATION PLANNING BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

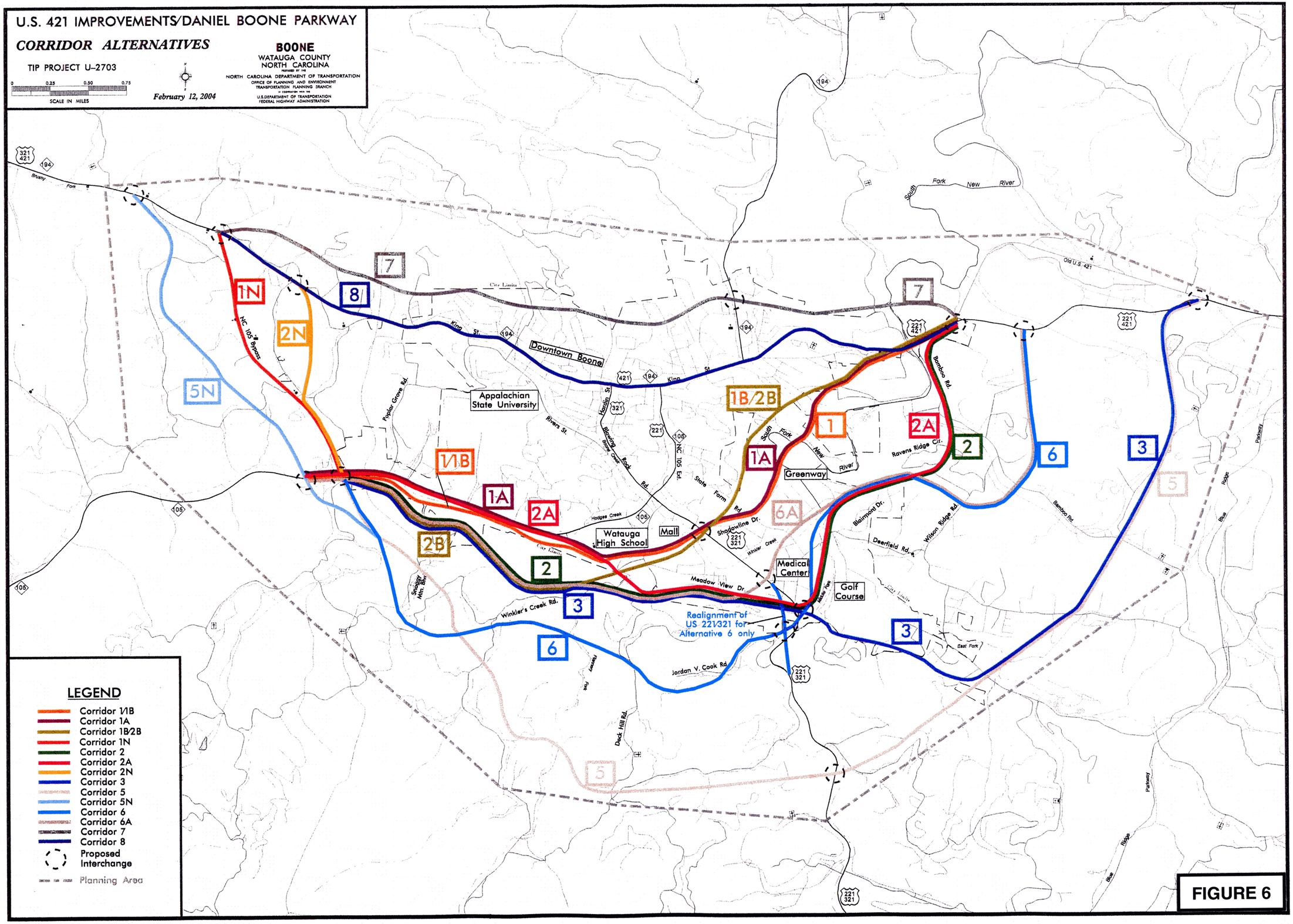

FIGURE 6

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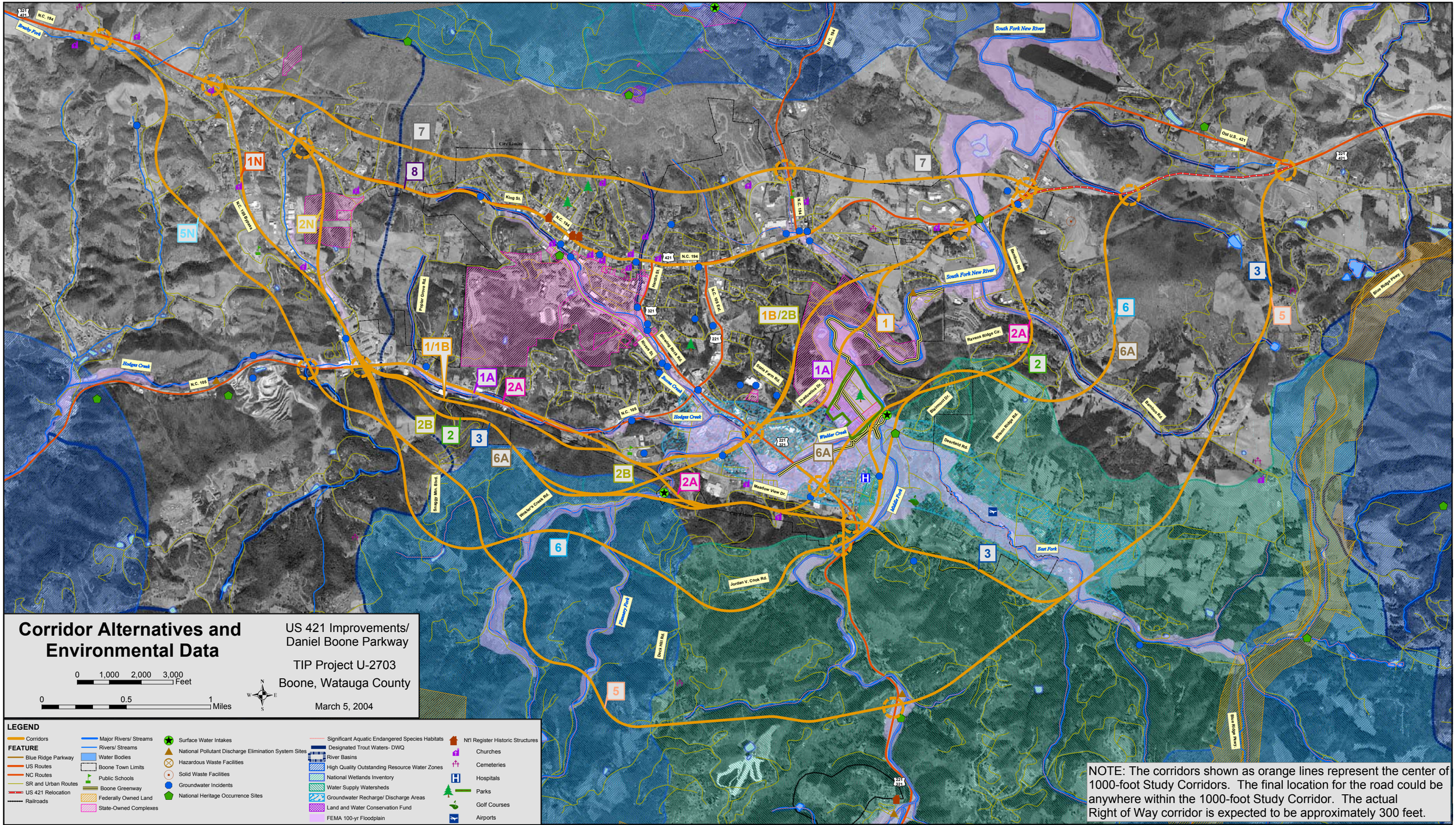
Corridor Alternatives and Environmental Data
US 421 Improvements/ Daniel Boone Parkway
TIP Project U-2703
Boone, Watauga County
March 5, 2004
0 1,000 2,000 3,000 Feet
0 0.5 1 Miles
N
W
E
S
LEGEND
Corridors
FEATURE
Blue Ridge Parkway
US Routes
NC Routes
SR and Urban Routes
US 421 Relocation
Railroads
Major Rivers/ Streams
Rivers/ Streams
Water Bodies
Boone Town Limits
Public Schools
Boone Greenway
Federally Owned Land
State-Owned Complexes
Surface Water Intakes
National Pollutant Discharge Elimination System Sites
Hazardous Waste Facilities
Solid Waste Facilities
Groundwater Incidents
National Heritage Occurrence Sites
Significant Aquatic Endangered Species Habitats
Designated Trout Waters- DWQ
River Basins
High Quality Outstanding Resource Water Zones
National Wetlands Inventory
Water Supply Watersheds
Groundwater Recharge/ Discharge Areas
Land and Water Conservation Fund
FEMA 100-yr Floodplain
Nt'l Register Historic Structures
Churches
Cemeteries
Hospitals
Parks
Golf Courses
Airports
NOTE: The corridors shown as orange lines represent the center of 1000-foot Study Corridors. The final location for the road could be anywhere within the 1000-foot Study Corridor. The actual Right of Way corridor is expected to be approximately 300 feet.

FIGURE 6 b

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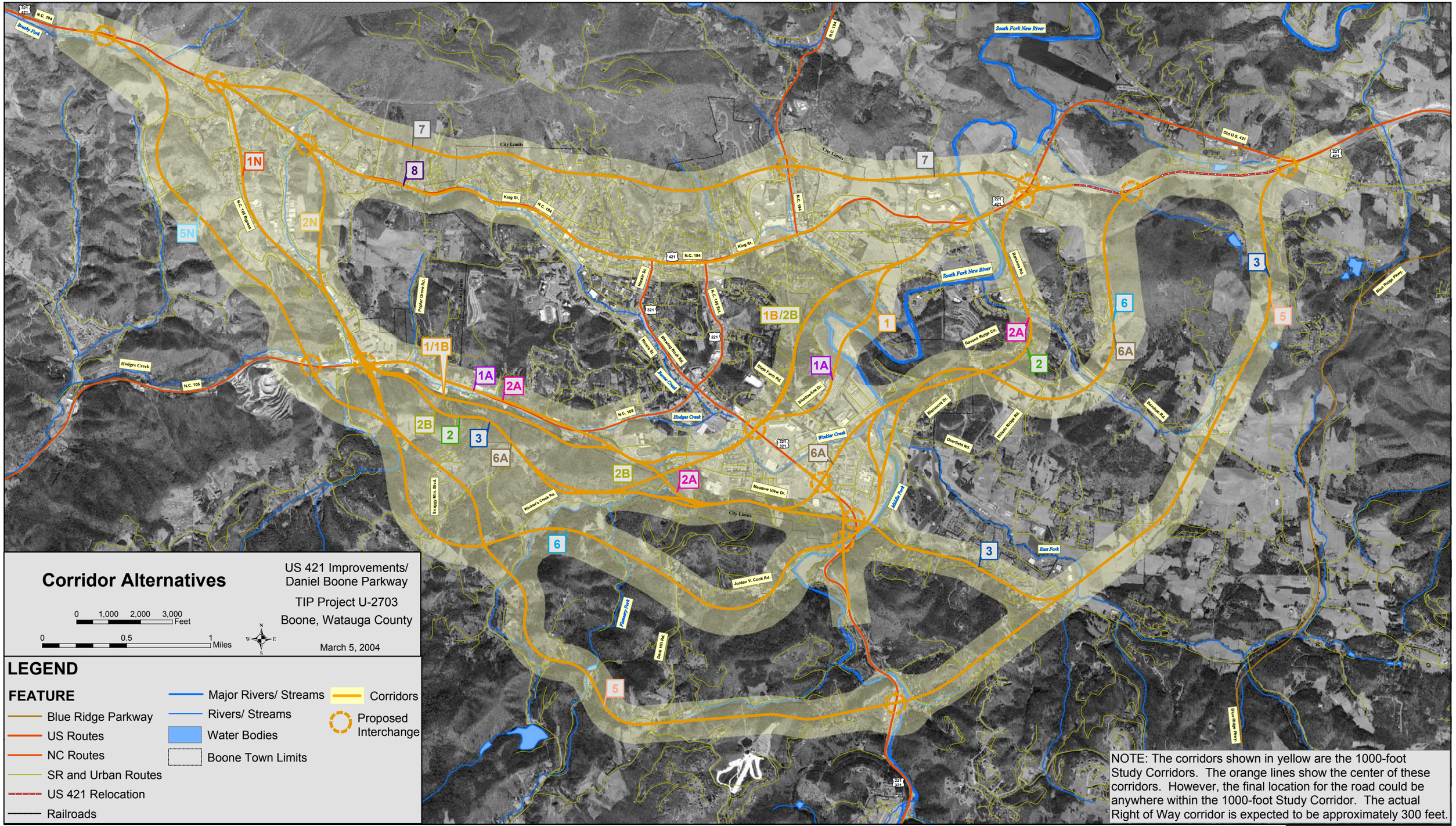
Corridor Alternatives
US 421 Improvements/
Daniel Boone Parkway
TIP Project U-2703
Boone, Watauga County
March 5, 2004
0 1,000 2,000 3,000 Feet
0 0.5 1 Miles
LEGEND
FEATURE
Blue Ridge Parkway
US Routes
NC Routes
SR and Urban Routes
US 421 Relocation
Railroads
Major Rivers/ Streams
Rivers/ Streams
Water Bodies
Boone Town Limits
Corridors
Proposed Interchange
NOTE: The corridors shown in yellow are the 1000-foot Study Corridors. The orange lines show the center of these corridors. However, the final location for the road could be anywhere within the 1000-foot Study Corridor. The actual Right of Way corridor is expected to be approximately 300 feet.

FIGURE 6 c

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U.S. 421 IMPROVEMENTS/DANIEL BOONE PARKWAY

CORRIDOR ALTERNATIVES TO STUDY FURTHER

TIP PROJECT U-2703

0 0.25 0.50 0.75

SCALE IN MILES

February 11, 2005

BOONE
WATAUGA COUNTY
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING AND ENVIRONMENT
TRANSPORTATION PLANNING BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

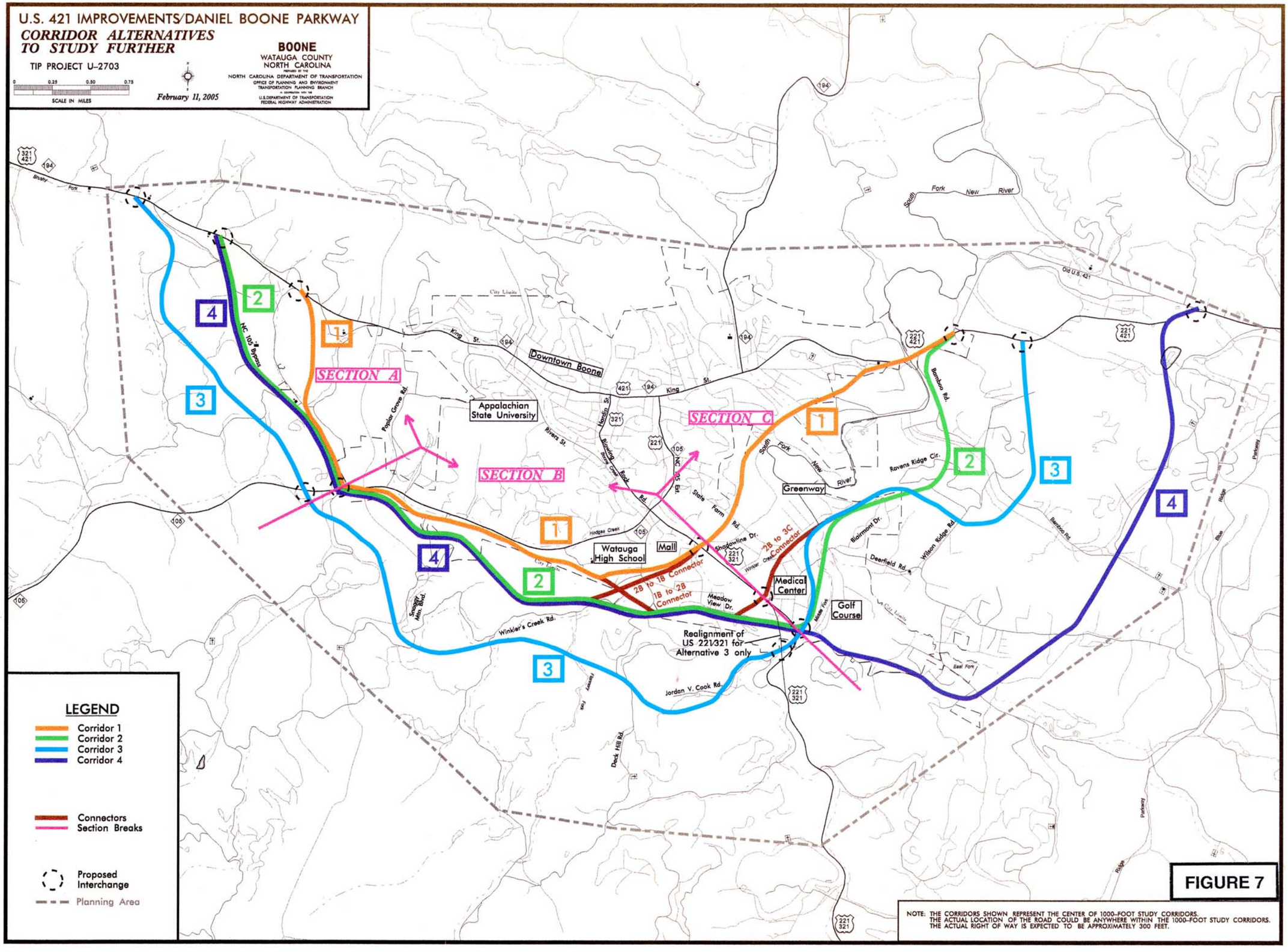

FIGURE 7

NOTE: THE CORRIDORS SHOWN REPRESENT THE CENTER OF 1000-FOOT STUDY CORRIDORS. THE ACTUAL LOCATION OF THE ROAD COULD BE ANYWHERE WITHIN THE 1000-FOOT STUDY CORRIDORS. THE ACTUAL RIGHT OF WAY IS EXPECTED TO BE APPROXIMATELY 300 FEET.

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